

# VMU SERIES Venturi Mixing Unit for V4730C/V8730C Gas Controls

## PRODUCT DATA



## APPLICATION

NOTE: Photo shows Venturi Mixing Unit with gas valve and manual shutoff valve installed.

The venturi mixing unit (VMU), combined with the V4730C/V8730C gas valves and specific direct current (dc) fan, has been developed for modulating premix appliances like gas burners and gas boilers.

The venturi manifold is a gas/air mixing unit that allows modulation of a premix burner with constant gas/air ratio down to 14 to 17% of maximum load. It is used in combination with a fan and the V4730C/V8730C 1:1 regulation gas valve.

The modulation is accomplished by changing the fan speed.

The fan is typically mounted downstream of the venturi.

The outlet pressure of the gas valve is regulated to ambient pressure by the gas valve.

The venturi generates a negative pressure against the ambient pressure by which the gas is drawn through the gas valve outlet.

The venturi manifold is sealed with an O-ring to the fan. The O-ring is already installed in the venturi assembly.

The V4730C/V8730C Gas Valve can be fitted directly on the manifold assembly.

All regulation adjustments are made on the gas valve.

When necessary, a connection can be provided between the inlet of the venturi manifold and the gas pressure regulator to ensure constant gas/air ratio in any circumstances.

The venturi manifold system is designed to be fitted in up to six positions on a dc fan, using six M8 bolts.

## FEATURES

- **All adjustment and test points are accessible from one side.**
- **Has a wide modulation band (14 to 100% of the boiler load).**
- **Flexible mounting positions of gas control to venturi manifold and venturi manifold to fan.**
- **Two stainless steel sensing tubes are provided for use with or without manual safety shutoff valve.**



## SPECIFICATIONS

**Models:** See Table 1.

**Table 1. VMU Model and Load.**

Model	Reference Load
VMU 150A	150 kW (512,000 Btuh)
VMU 300A	300 kW (1,024,000 Btuh)
VMU 335A	335 kW (1,143,000 Btuh)
VMU 500A	500 kW (1,700,000 Btuh)

**Dimensions:** See Fig. 1.

**Ambient Temperature Range:** 32°F to 212°F (0°C to 100°C).

**Gas Valve Connection:**

Four M5 screws and a rubber O-ring are provided with the venturi to assemble it to the V4730C/V8730C gas valve.

The stainless steel tube provided with the venturi has to be connected between the venturi inlet (connection provided) and the gas valve regulator.

Longer sensing tube for use with manual safety shutoff valve (part number KTTBA002).

Shorter sensing tube for use without manual safety shutoff valve (part number KTTBA001).

**Fan Connection:** The venturi is connected to the fan using six M8 bolts (obtained separately).

**Minimum Load:** The minimum load for which the unit can be used is 14 to 17% of the reference load, which equals a minimum pressure differential of 0.2 in. wc (50 Pa) of the 1:1 gas control.

**Pressure Drop:** Approximately 3.2 in. wc (800 Pa) across the venturi at reference load.

**Tracking Inaccuracy:** The tracking inaccuracy is the deviation from a constant gas/air ratio over the modulation band (14 to 100%). The tracking inaccuracy is typically 3% to 6%.

**Materials:**

Housing: Aluminum.

Venturi: Statically dissipative statcon PF.

Seals: Rubber (NBR).

**Accessories (order separately):**

Manual Shut-Off Valve Kits can be ordered to provide manual shut-off function:

50002653-001 for 1 in. NPT or smaller valves.

50002653-002 for 1-1/4 in. NPT valve.

KTTBA001 Short Sensing Tube for VMU 150/300/335 kW Venturi Mixing Units.

KTTBA002 Long Sensing Tube for VMU 500 kW Venturi Mixing Unit.

**Approvals:**

Underwriters Laboratories, Inc. (UL): MH18476.

Canadian Standards Association (CSA): File Number 158151-1227192

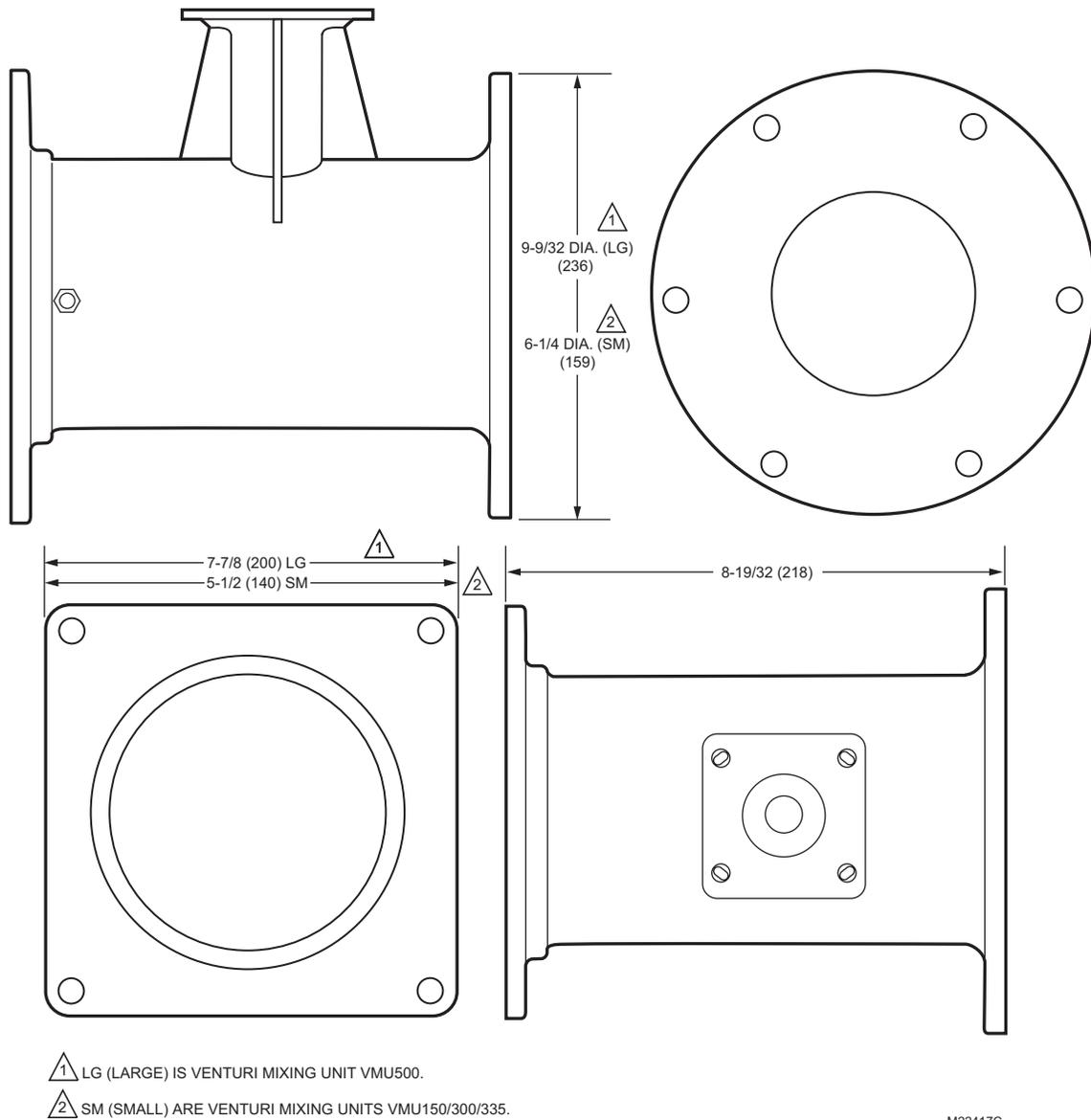


Fig. 1. Venturi Mixing Unit, dimensions in in. (mm).

## INSTALLATION

See form number 65-0281 for installation instructions.

Make sure the venturi inlet is not obstructed. This will influence the air factor if the connection between the inlet of the venturi and the pressure regulator on the gas valve is not made.

If the distance from another boiler component to the venturi inlet is more than 4 inches (100 mm), air factor and boiler load are not influenced.

There is a strong interaction between the venturi, gas control and burner. For this reason, it is important to fit the characteristics of these components to each other. If not matched well, for instance, acoustic problems could be generated.

It is recommended to test the appliance at both cold start and hot start conditions with high and low caloric test gases.

The stainless steel tube that comes with the Venturi Mixing Unit must be connected between venturi inlet and gas valve regulator. Use only the correct tube length (supplied) for the installation.

## ADJUSTMENTS AND CHECKOUT

NOTE: All adjustments are made on the gas valve and not on the venturi.

## Adjustment

1. Check gas input to the appliance using a pressure gauge with a resolution of 0.004 in. wc (1 Pa [0.01 mBar]) connected to the outlet pressure tap (connection 3 on either side of the valve).
2. Put CO<sub>2</sub> meter probe (inaccuracy <0.1%) into exhaust gas outlet.
3. Screw throttle adjustment screw approximately half-way down (about 1/8 in. [3.5 mm]).
4. Start appliance.
5. Run appliance at maximum load.
6. Observe CO<sub>2</sub> meter and adjust throttle screw until CO<sub>2</sub> percentage is at nominal value.
7. Turn throttle screw clockwise to reduce gas flow and CO<sub>2</sub> percentage.
8. If appliance does not start, turn throttle screw 1/2 turn counterclockwise and repeat starting procedure.
9. Keep appliance running until completely stabilized; modify adjustment when necessary.
10. Set appliance to minimum load.
11. Check offset pressure according to manufacturer instructions.
12. Repeat above steps when adjustment of offset pressure is necessary.
13. After adjustments are made, stop appliance, disconnect pressure gauge and CO<sub>2</sub> meter and tighten outlet pressure tap.
14. Test for gas leaks.

## Final Installation Checkout

After any adjustment, set appliance in operation. Observe several complete cycles to ensure that all burner components function properly.

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